

UNDERSEAWARFARE

U. S. S U B M A R I N E S ... B E C A U S E S T E A L T H M A T T E R S

PERISHER:

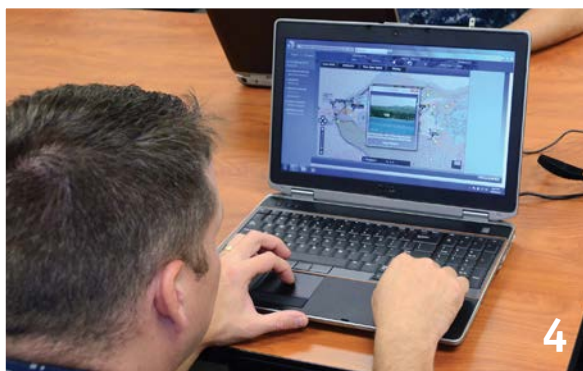
An inside look
at the Netherlands
Submarine Command
Course

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while underway

Junior Officers of the Year
visit the Nations Capitol

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On the Cover



HNLMS *Walrus* after completing a personnel transfer in support of the Netherlands Submarine Command Course, commonly referred to as "Perisher."

Photo by Lt. Cmdr. Ryan Mewett

UNDERSEAWARFARE

THE OFFICIAL MAGAZINE OF THE U.S. SUBMARINE FORCE

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FORCE COMMANDER'S CORNER

Vice Adm. Michael J. Connor, USN
Commander, Submarine Forces



Submariners,

What a year 2014 is shaping up to be! The continued professionalism, dedication, and resiliency exhibited by the Submarine Force continues to impress. There is no shortage of demand for the capabilities you provide to the Combatant Commanders or our friends and allies around the world. Whether on deployment or in exercises, our Submariners are performing magnificently.

As we finish spring and look ahead to summer, I ask everyone to take a moment to reflect on some significant events that have profoundly shaped our community and remember those who have paid the ultimate sacrifice for our Navy and our country. In April, Submariners worldwide celebrated the 114th anniversary of the force. This spring also marks the 46th anniversary of the loss of USS *Scorpion* (SSN-589), the 51st anniversary of the loss of USS *Thresher* (SSN-593), and the 60th anniversary of the Battle of the Philippine Sea, where USS *Albacore* (SS 218) sank the Japanese carrier and flagship *Taiho* with a torpedo shot. On the same day during that battle, USS *Cavalla* (SS 244) torpedoed and sank the Japanese carrier *Shōkaku*. Also this September we will be celebrating the 60th anniversary of USS *Nautilus* (SSN 571), the world's first operational nuclear-powered submarine. All of these events in conjunction with the national observance of Memorial Day, should be a reminder to never forget all service members who have given their lives in support of our country. Please take a moment to recognize and remember the sacrifice they and their families have given.

Thank you for all that you do. Our Submarine Force is strong because of the incredible dedication and hard work provided by Submariners.

I am proud of you all.

“Our Submarine Force is strong because of the incredible dedication and hard work provided by Submariners.”

A handwritten signature in black ink, reading 'M J Connor'. The signature is stylized, with the first letters of the first and last names being prominent.

M J Connor



DIVISION DIRECTOR'S CORNER

Rear Adm. Joseph E. Tofalo, USN
Director, Undersea Warfare Division

Undersea Warriors,

I have been your Director of Undersea Warfare for just under six months now and can tell you that I am excited more than ever at the future of our Submarine Force. Admiral Connor has laid out his strategy to maintain undersea dominance and I am working closely with him to outline the resources we will need to execute that strategy.

In the previous issue, I outlined my top three priorities as director:

- We absolutely must have an uninterrupted, survivable nuclear deterrent. This is the Navy's number one priority. You hear the CNO, Admiral Greenert, say that all the time. The President himself has said that, as long as there are nuclear weapons, the United States will maintain a safe, secure, and effective nuclear deterrent.
- Our second priority is the *Virginia*-class itself at a build rate of two per year. The President's Defense Strategic Guidance says that we must maintain the undersea capability to ensure access to anti-access/area denial environments. To do that, we must have the force structure that gets us inside where we need to be.
- Our number three priority is to deliver the payload capacity and the payloads to address future global security challenges. The Virginia Payload Module is obviously the centerpiece of that. We've got to have it.

Beyond my top three, I'm looking at ways we as a force can provide influence beyond the platform. This includes both unmanned undersea vehicles (UUVs) and weapons. We are counting on UUVs in the future to supplement our manned forces and extend our reach. UUVs are an important part of a transition from a platform-centric to a domain-centric undersea dominance approach. I am also excited about the opportunities with other payloads. There are numerous options on the table, from conventional prompt strike and missiles used in other parts of the Department of Defense, to new ways of delivering Special Operations Forces vehicles, lasers, cyber effects, and others.

The challenge of maintaining undersea dominance is very dynamic – we're either getting better, or we're getting worse, we're never standing still. As we navigate the fiscal shoals ahead, we will continue to find innovative ways to maintain our undersea advantage.

Thank you for all you do. Keep charging ahead!

"...maintaining undersea dominance is very dynamic— we're either getting better, or we're getting worse, we're never standing still."

J. E. Tofalo

UNDERSEAWARFARE

The Official Magazine of the U.S. Submarine Force

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UNDERSEA WARFARE is the professional magazine of the undersea warfare community. Its purpose is to educate its readers on undersea warfare missions and programs, with a particular focus on U.S. submarines. This journal will also draw upon the Submarine Force's rich historical legacy to instill a sense of pride and professionalism among community members and to enhance reader awareness of the increasing relevance of undersea warfare for our nation's defense.

The opinions and assertions herein are the personal views of the authors and do not necessarily reflect the official views of the U.S. Government, the Department of Defense, or the Department of the Navy.

Contributions and Feedback Welcome

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CHINFO Merit Award Winner



Silver Inkwell Award Winner

LETTERS TO THE EDITOR

In keeping with *UNDERSEA WARFARE* Magazine's charter as the Official Magazine of the U.S. Submarine Force, we welcome letters to the editor, questions relating to articles that have appeared in previous issues, and insights and "lessons learned" from the fleet.

UNDERSEA WARFARE Magazine reserves the right to edit submissions for length, clarity, and accuracy. All submissions become the property of *UNDERSEA WARFARE* Magazine and may be published in all media.

Please include pertinent contact information with submissions.

Send submissions to:

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TO THE EDITOR

I really enjoyed the current edition of Undersea Warfare Digest [magazine], especially the extensive coverage of NUWC. I had the privilege of being stationed at NUWC NPT in the late '70s when it was NUWES NPT. I was attached to PCU *Ohio* undergoing new construction at Electric Boat, Groton, CT; we were training at NPT. I am a plank owner of 726 and deployed on her before transfer to CSS 17, Bangor, WA. Keep up the good work.

If I may, there are two errors on page 26. Bangor, Maine should read Bangor, Washington under the Battle E category for 739 and 726.

Sincerely,
Bill
W.P. Lyle, FTCM(SS)
USN Ret

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SAILORS FIRST

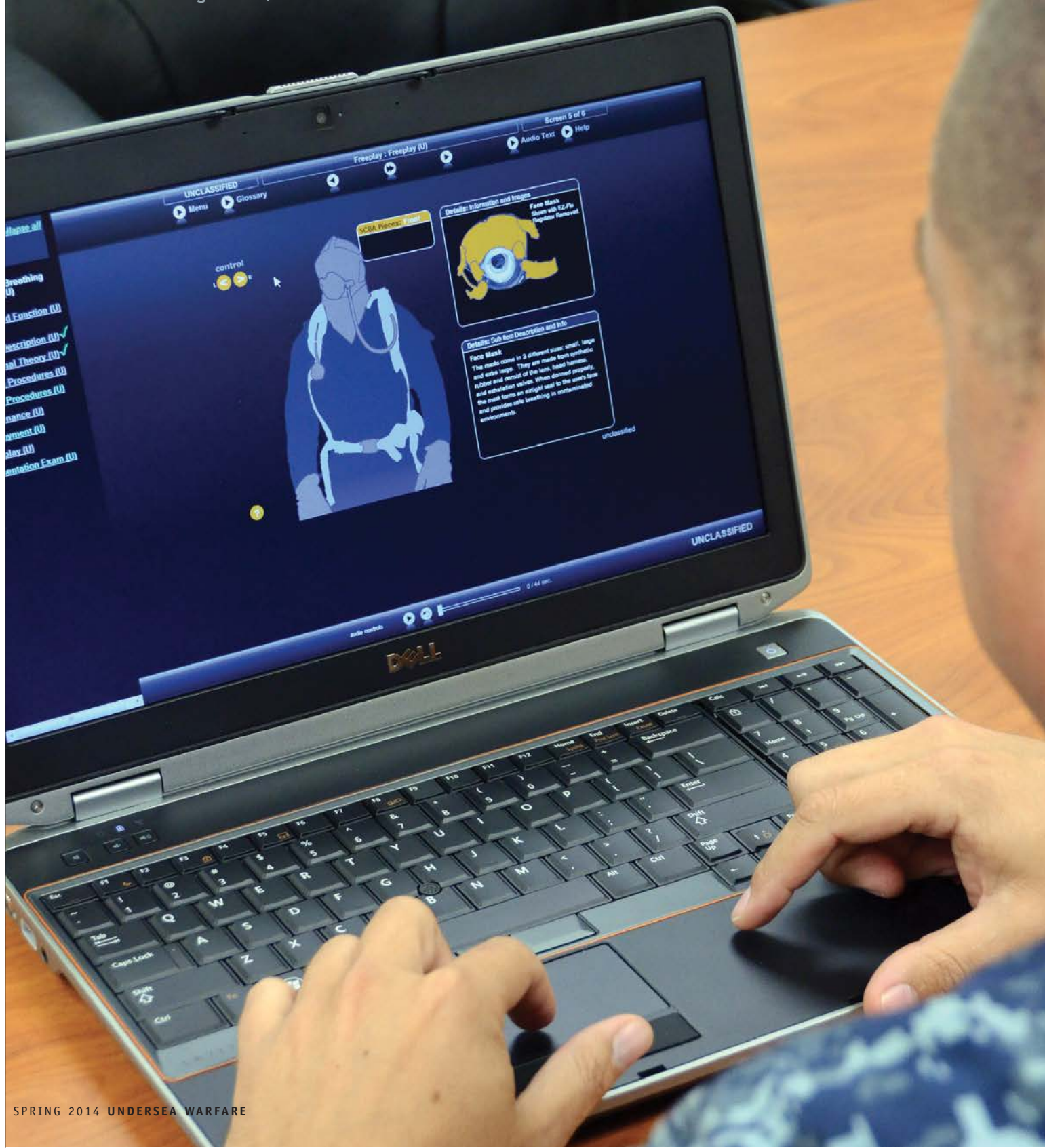


Sonar Technician (Submarine) 3rd Class Brandon McClain hugs his wife after returning from deployment aboard the *Los Angeles*-class fast attack submarine USS *City of Corpus Christi* (SSN 705). While on deployment in the western Pacific region, *Corpus Christi* conducted a variety of operations and theater security exercises contributing to the nation's strategic posture in the region.

Photo by MCS 1C Steven Khor

Submarine On Board Training: Learning

by William Kenny
Submarine Learning Center, PAO



on the go for Undersea Warriors

Today's Submarine On Board Training has evolved greatly since its first inception as the Submarine Tactical On Board Training (STOBT), circa 1986. A name change, sharpening of mission focus, expansion of tasks and tools to train submarine crews and to painlessly track that training are just the most obvious differences.

Cmdr. Glenn Porterfield, Director of Submarine On Board Training for the Submarine Learning Center (SLC), explains, "STOBT, as it was called when it began in 1986, was an effort to quickly generate lessons learned for deficiencies identified during Tactical Readiness Examinations (TREs). As such, STOBT was more focused on tactics, techniques, and procedures; for example, the boat is not performing as successfully in a particular task and we want to be able to offer better guidance and interpretation of the tactical warfighting publications. That was the driver, and it was hoped that having a shorter organizational distance from policy makers to those carrying out the policies would be reflected in a much shorter production pipeline in getting training aids to the boat."

"SOBT has over 650 products, including about 20 high-end, fully interactive simulators for combat systems or other systems throughout the boat. They provide the experience of troubleshooting in a variety of scenarios that you might otherwise never be able to do. We offer products that cross submarine classes and have added resources to fund modifications and refinements, all from the original investment in a training product for one class of submarine."

As Cmdr. Porterfield points out, the SOBT mission remains true to its origins. "The scope of what we do now is much greater than what we did in the late '80s and early '90s. We have SOBT courseware for individual training across the spectrum for basic submarine qualifications on systems from bow to stern throughout the boat, not just tactical products. SOBT courses are also much higher quality and more interactive compared with the assortment of VHS videos, 35mm slide shows, and self-study workbooks that STOBT mailed out in the past.

"We encompass basic submarining qualifications, basic engineering qualifications, as well as how to operate and maintain certain pieces of equipment. SOBT is a rapid-fire

means of immediate need and use training products our Sailors take with them while underway – perhaps most importantly including lessons learned from significant mishaps. It's training on the shelf for most circumstances when you need it and where you need it."

Multi-platform, multi-tasking requires coordination of production and delivery schedules to assure the most bang for the buck. Cmdr. Porterfield and the SOBT team know money, always in tight supply,

A sampling of SOBT high-end course offerings

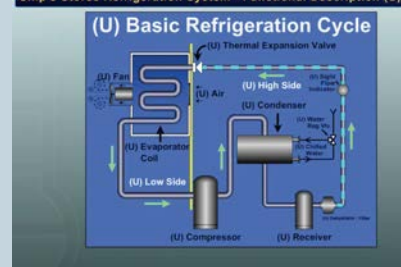
Individual courses:

- SS Voyage Management System
- SS Piloting Brief Plymouth, England
- SS Piloting Brief Norfolk, VA Naval Region
- SS Piloting Brief Groton, CT
- SS Escape and Survivability
- SS Advanced Electronic Warfare System (ES) Operator
- SS Weapons Handling Equipment Inspection
- SSN 688 BSQ Emergency Flood Control System
- SSN 688 Helmsman/Planesman
- SSBN/SSGN Chief of the Watch
- SSBN/SSGN BSQ Torpedo Tubes
- SSN 21 BSQ Basic Secondary Power Plant
- SSN 774 BEQ Power Generation and Conversion
- SSN 774 Watchstation Qualification Pilot (several volumes)

Ship's Stores Refrigeration System Components (U)



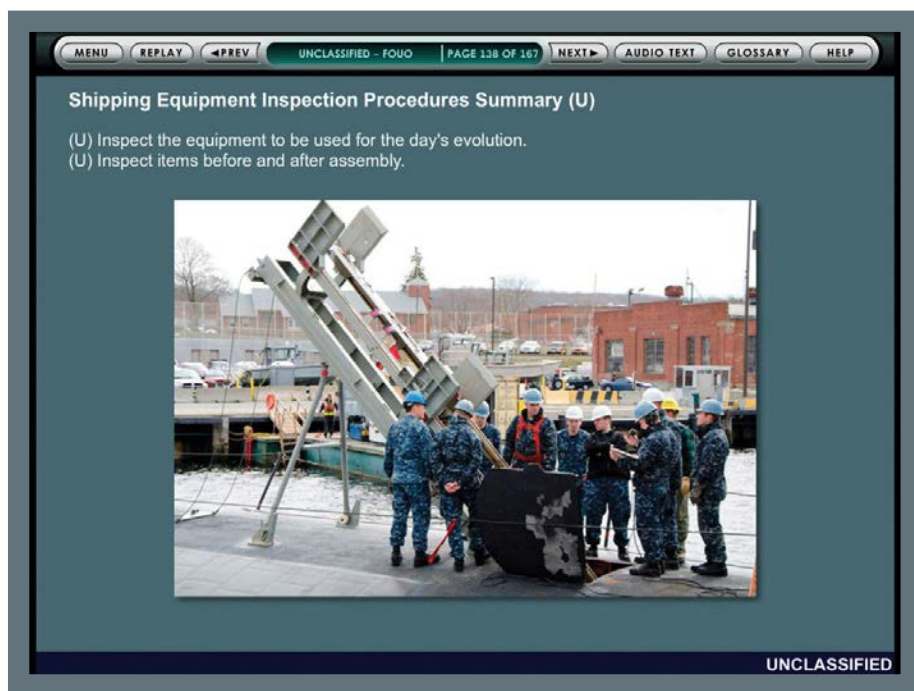
Ship's Stores Refrigeration System - Functional Description (U)



Full scale simulators:

- ADCAP Post-Launch Trainer (APLT)
- SUBSKILLSNET
- SSN 688 Virtual Interactive Shipboard Instructional Tour (VISIT)
- SSBN Virtual Interactive Shipboard Instructional Tour (VISIT)
- PC Periscope

There are a total of 20 simulators, 36 piloting briefs, and 597 other products. The entire catalog is available for viewing and/or ordering on our website at <http://www.netc.navy.mil/sobt/web/index.html>.



Sample track from SSN 688 course titled Weapons Handling Equipment inspection

remains rationed even as demand for products skyrockets.

“Everyone is looking for cost savings and efficiencies,” he says, “so through our synergistic curriculum development process we have been able to take products originally designed to be used on board a boat and, with some minor alterations, use it in support of SLC school houses, ranging from apprentice training through some of the more advanced courses. In some cases, formal school house course content has been repackaged as a SOBT product.”

Responsiveness to fleet needs drives SOBT production priorities, from maintaining an already established product to gearing up a whole new product. What’s needed is what is produced, says Porterfield, no more but certainly no less. Prioritizing correctly is essential with scarce funds.

“We are working on lessons learned products derived from Safety Board and JAG investigations of the USS *Montpelier* (2012) and USS *Jacksonville* (2013) collisions to capture and convey conclusions on best practices that can be shared across the fleet. The enduring product we develop allows us to offer a uniform message that remains constant from crew to crew and from iteration to iteration whenever it’s used, meaning every Sailor learns the same lessons in the same way whenever a given training module gets used.”

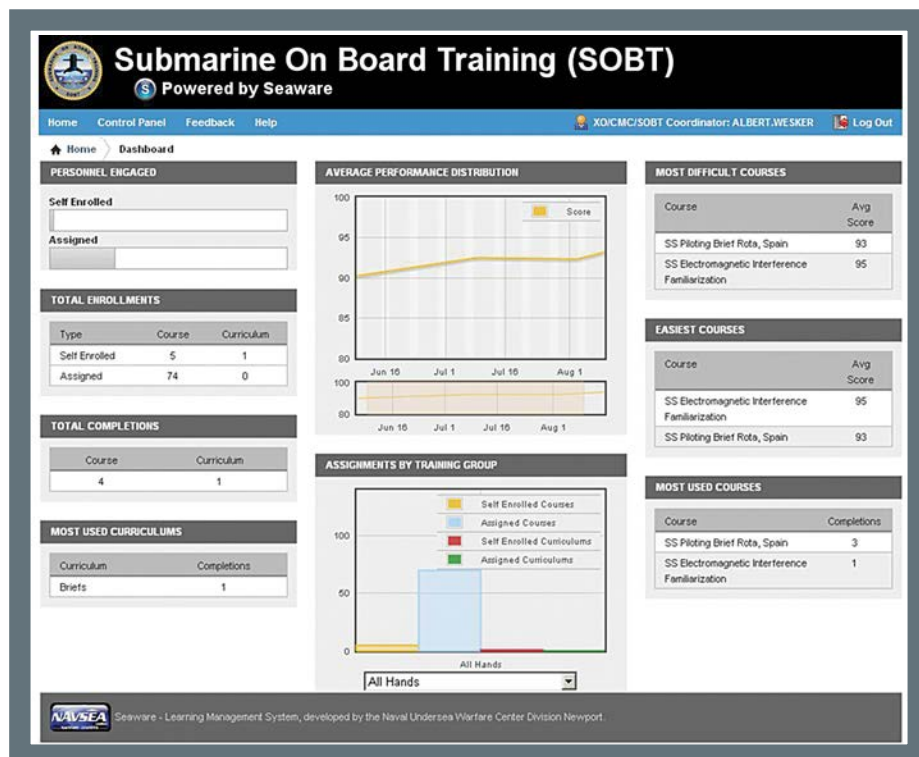
Making the Whole System Work

“Technological advances have helped SOBT better measure the impact and reach of its distributed training programs while radically reducing the administrative burden for each submarine,” explains LCDR Michael Shine,

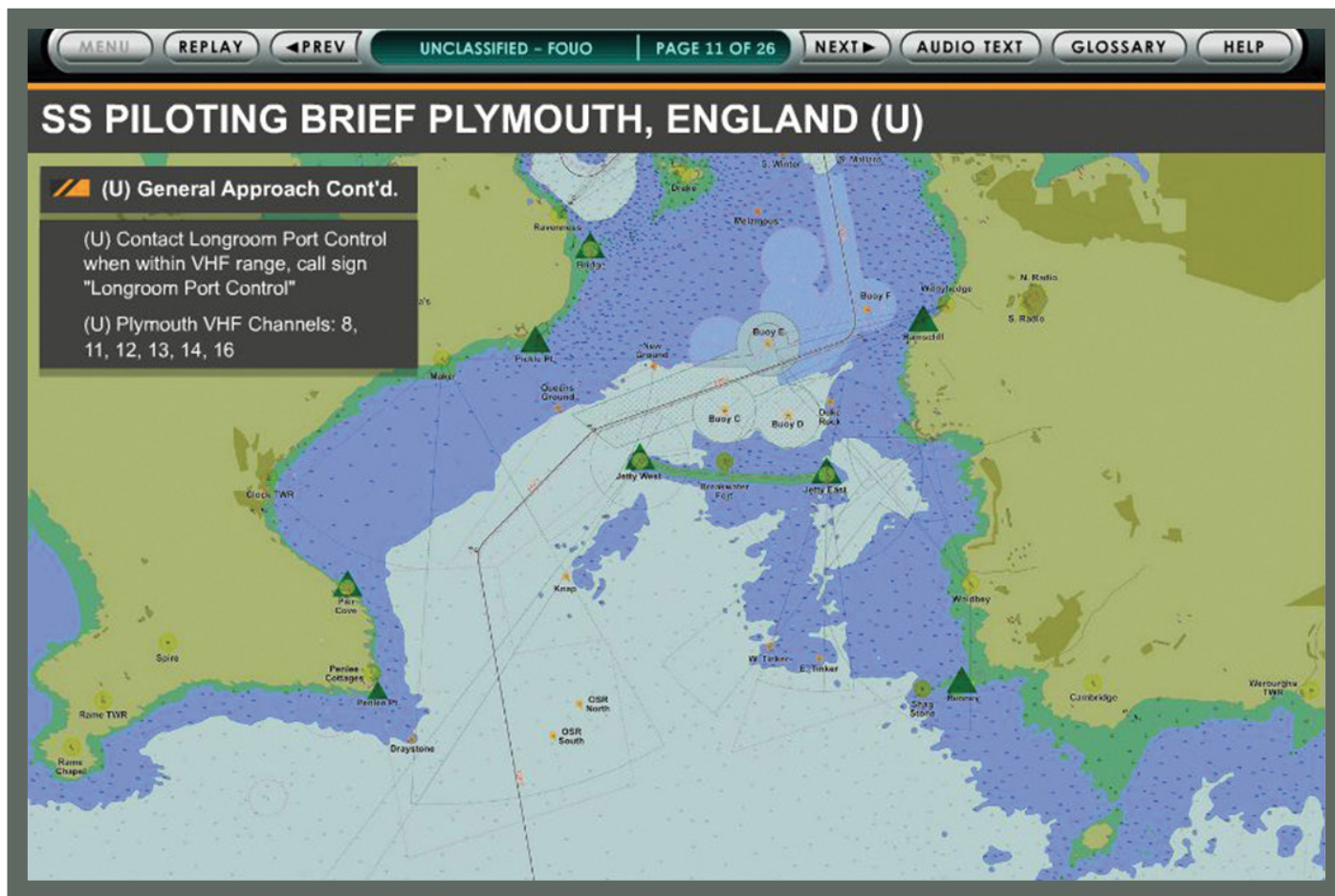
SOBT Program Coordinator.

“The Naval Undersea Warfare Center Newport Distance Support team built a Learning Management System similar to Navy Knowledge Online (NKO) called SEAWARE. We’ve been shipping that to the boats since June 2013 along with regular SOBT updates, allowing them to log in with a single sign-on feature already available in the Submarine Local Area Network (SUBLAN), so they only have to remember one user name and password. If they wish to go to SOBT, they first log in to the LAN and then log in to SEAWARE to access our content.

“Type Commanders have standardized qualification cards for every sub class through the Continuing Training Qualification Software, which in many cases uses a SOBT product as a pre-requisite. Through SEAWARE, Sailors can document their progress and bookmark their place if they don’t have time to finish the whole course in one sitting. They can work on it as their schedule allows instead of having to restart from the beginning every time they sign in. Multiple users can access a single course simultaneously, and the boats with two alternating crews (SSBNs and SSGNs) can use SOBT while in the Off-Crew Administration Building via their SIPRNet workstations, thanks to



SEAWARE records how much time has been spent in the course, how many sailors have been enrolled, how many completed it, what their grades were, and tests them at the end.



Sample navigation track from one of many piloting briefs utilizing Voyage Management System to best illustrate what the navigation team would have as tools.

the Ship-to-Shore Data Exchange managed by NUWC Keyport.

“SEAWARE records how much time has been spent in the course, how many Sailors have been enrolled, how many completed it, and what their grades were, and it tests them at the end if the course has a test. It also includes the number of times a course was dropped, if it was used before it was dropped, and how much time was spent in it. Ship’s leaders may log in as a supervisor and perform supervisor-unique functions such as assigning SOBT courses to be completed or create training groups and assign a course to the whole group. They would also see certain metrics displayed for ease of tracking, such as in the picture at left.

“We have a single external hard drive with the entire catalog of SOBT products that we send to the boats on a semi-annual basis so they can refresh and update the shipboard package in just hours. As each boat’s SOBT content is updated through that replaceable hard drive, the LAN Administrator is also running a report exporting all user information onto the old hard drive, which is then

... the quantity of SOBT products is matched by the quality of each, both individually and as part of a larger body of learning”

ETCM (SS) James McGee, SOBT Senior Enlisted Adviser

returned to us.

“At the same time, he exports all course completion data for SOBT staff to upload to the Fleet Training Management and Planning System (FLTMPS), the Navy’s tracking system. In this way, Sailors automatically get credit for the courses on their SMART transcript, which removes an additional administrative burden from the boat.”

“Change is and always has been the natural order of things, which applies especially to Submariners, who must remain flexible and adapt to frequent upgrades in their tools and working environments. SOBT now provides a dynamic, state-of-the-art learn-

ing experience that enables Submariners to continually expand their skill sets whether at base or underway,” states Cmdr. Porterfield. “Within the next 12 to 18 months, we anticipate the debut of a new YouTube-like interface, tentatively called the Submarine Learning Channel, which will provide short video clips to refresh or enhance concepts that may have been previously learned but not frequently employed. When we say ‘this isn’t your father’s SOBT anymore,’ it’s not a cliché, it’s a statement of purpose. Submarine On Board Training is serious professional skills training for serious professional Submariners.”



Pass or Perish

A U.S. Submariner Swaps SSNs for SSKs

BRRRRRT! One klaxon sounded over the ship's announcing circuit, and I started awake a few hours before dawn, just 15 minutes after laying down for a quick nap. I was Duty Captain (DCO) of the Dutch submarine HNLMS *Walrus*, and the Watch Leader had just ordered a "crash stop snort": emergency secure snorkeling, in U.S. submarine parlance. I rolled out of my rack in the torpedo room, pulled on my boots, and hurried up to the control room.

"Duty Captain, the M frigate turned towards," the Watch Leader reported as I entered control. "Range 8,000 yards. We may have been counterdetected."

Decision

Walrus had been snorting off the coast of Northern Ireland a few hours before sunrise. We had completed a covert, opposed penetration of the Orsay gap, a narrow area of shallow water offering the only way into our operating area in the North Channel between Northern Ireland and southwestern Scotland. After almost 12 hours of high-speed transit and evasion from anti-submarine warfare (ASW) frigates and helicopters, the battery had reached a critical state. We had returned to periscope depth (PD) to snort and charge in advance of a full day of simulated minelaying and intelligence, surveillance, and reconnaissance missions close to an enemy coast; on arriving at PD we found one of our opponents, HNLMS *Van Speijk*, a Dutch M-class ASW frigate.

Walrus was just a few hours from a time-critical mission, several miles from the target, with a drained battery, and a determined enemy nearby. I had slept just minutes in the last day, scant hours in the last week, was dumb with exhaustion, and was staring at one of the first big problems of a seemingly endless two day "mini-war" to come. In short, I was pushed to my limits in exactly the kind of challenging, decision-rich spot that the Netherlands Submarine Command Course (NLSMCC), or "Perisher," was designed to produce—and it was time to make a decision.

HNLMS *Walrus* shortly after completing a boat transfer near Kilchattan Bay, Scotland.

The Chance of a Lifetime

Just a few months earlier, I had never set foot on an active submarine that wasn't a U.S. SSN. After tours as a junior officer in USS *Helena* (SSN 725) and Weapons Officer in USS *San Francisco* (SSN 711), I was serving on the OPNAV staff in the Undersea Warfare directorate (N97). I knew that American officers occasionally attended the United Kingdom's Submarine Command Course and that it was very difficult—and I was looking for a challenge. I inquired with the detailee for more information and, after a few months, I was offered the opportunity to attend the Dutch SMCC. Until this point, I hadn't known that the Netherlands (and Norway, as I would come to learn) had its own command course; as a Pacific submariner, I didn't know very much about our European allies and their submarine forces. I jumped at the chance and learned what I could before visiting the Netherlands for a two-week familiarization period in September 2013.

Since 1995, the RNLN has conducted its SMCC for Dutch and Australian prospective commanding officers under a memorandum of understanding with the Royal Australian Navy (RAN). NLSMCC is descended from

the UK's SMCC, which began in 1917 and trained both British and foreign submarine officers for command until 1994, when the Royal Navy (RN) submarine force went all-nuclear and ended its diesel submarine (SSK) command course. The RNLN and the RAN, still in need of a course to train and select SSK commanding officers, elected to continue the SSK course in the Netherlands.

Both the Dutch and the UK SMCCs are colloquially referred to as "Perisher" thanks to their high attrition rates. Historically, approximately one-third of candidates do not successfully complete the course.

Soon after starting their course, the Dutch began to accept other foreign students. From 1995 to 2013, 100 students from 13 countries have participated in the course, and since 2002 the USN had sent eight post-department-head candidates. (In exchange, the RNLN—which uses the Mk48 torpedo—routinely sends officers to torpedo schools at the Naval Undersea Warfare Center in Newport, RI and to the USN Submarine Command Course.) I was selected as the ninth USN officer to attend the course in NLSMCC 2014.

During the familiarization period, I spent a week at the Dutch navy base at Den Helder,

a little over an hour north of Amsterdam. Den Helder is home to all of the ships of the Royal Netherlands Navy (RNLN), including the four *Walrus*-class submarines that comprise the RNLN Submarine Squadron. Along with one other student, a Canadian, I met personnel associated with the submarine service and the command course, toured a submarine pierside, and received lectures about the command course and about Dutch procedures for navigation, periscope operations, ship control, and other areas. At the end of the first week, we flew to the UK and met HNLMS *Dolfijn* for a week underway to familiarize ourselves with the boat and its terminology and procedures.

The Walrus-Class Submarine

The *Walrus* class consists of four 222-ft. long, 2,600-ton diesel-electric submarines built in the Netherlands and operated since the early 1990s. Each boat has three diesel engines and an electric motor and incorporates significantly more automation than American submarines of a similar generation. One watchstander controls the rudder, fairwater planes, and stern planes, and an autopilot can be engaged if desired. Diesel start/stop, battery charging, most ventilation lineup changes, and speed changes are handled from a panel in the control room; from the order "prepare to snort" until batteries are charging typically just two or three minutes pass.

This simplicity of operation is important, as the boat typically snorts at least twice a day. Battery consumption is not directly proportional to speed, e.g., the discharge rate at 12 knots is not double the rate at 6 knots. Most operations are conducted at speeds below 6 knots, and speeds less than 3 are not uncommon. Even slow-speed operations will require a daily snort to recharge. Just as importantly, snorting is required to refresh the atmosphere; a *Walrus's* atmosphere control equipment is much less robust than that carried on an SSN. It has no ability to generate oxygen, and CO₂ scrubbing capacity can only moderate the rise of CO₂ levels rather than reducing them.

The sonar system consists of a cylindrical array, flank array, an intercept array, and an optional clip-on towed array. Though capable, the sonar processing systems look somewhat antiquated to American eyes—they most closely resemble BQQ-5, with a few add-on digital processors—and the



NLSMCC 2014 in the torpedo room of *Walrus* during COQCEX. From L to R, [first row] Lieutenant Commander Chris Holland, Royal Canadian Navy; Lieutenant Commander Stephen Blake, Royal Australian Navy; the author; Lieutenant Commander Marcos Cipitelli, Brazilian Navy; Commander Chris Unwin, Royal Australian Navy; [second row] Commander Geordie Klein, Royal Netherlands Navy (Teacher).



Safety phase trainer runs.

All photographs courtesy of the author

combat system essentially consists of a geo-plot on which an operator matches contact bearing and bearing rate with sonar, plus an automated digital CEP.

The piece of equipment I would become most familiar with was the periscope. A *Walrus* has two: a smaller, low-profile attack periscope and a slightly larger (but still quite small compared to a Type 18) search periscope. They each offer 1.5x, 6x, and 12x magnification, but unlike U.S. periscopes, do not have a doubler. Rather than raising to a fixed height, the periscope eyebox can be raised or lowered to any height between the deckplate level and an upper stop, allowing the operator to control his mast exposure. Most significantly, Dutch periscope ranging is done using a stadimeter vice a telemeter. To determine range, the operator must turn a dial to create a split image, raise the waterline in one image to match the ranging

height being used in the other, and use the minutes of arc measured to calculate range.

The automation built into the submarine, as well as the Dutch manning construct, allows for a much smaller crew. Like many others, RNLN submarines use port and starboard watch sections to man six-hour watches. Accordingly, the crew does little off-watch training or preventive maintenance at sea. The crew of about 52 sailors is divided into three departments: operations, technical, and logistics.

The wardroom makeup is also significantly different from our own. It typically consists of the Commanding Officer, Executive Officer, Marine Engineering Officer (MEO), Weapons Engineering Officer (WEO), Operations Officer (OPSO), Navigation Officer (NO), two to four junior warfare officers, and a handful of junior engineering officers. All officers are either warfare or

engineering; there is no overlap between the branches. Junior engineering officers grow up to be WEO, then MEO; junior warfare officers become Navigation Officer, Operations Officer, XO, then CO. Junior warfare officers stand watch as Watch Navigator—the Dutch equivalent of Quartermaster and Navigation Supervisor rolled into one. The NO and OPSO are the two Watch Leaders (Officers of the Deck), sometimes supplemented by the XO, who runs the ship's schedule and admin and serves as a senior watch officer; he is not command qualified. The CO typically has 12 or more years of experience, a great deal of which will have been spent in seagoing billets, and is a Perisher graduate.

Stopwatches

In January 2014, after a few months back in my shore job, I returned to Den Helder to begin the SMCC proper. Four other officers

began the course with me: two Australians, a Brazilian, and a Canadian, all from diesel submarine backgrounds. We would grow close over the coming months, and each of us taught the others about his experiences and his submarine force's way of doing business. We were the second NLSMCC class to have no Dutch students.

Our instructor and evaluator was RNLN Commander Geordie Klein, better known as "Teacher." He was responsible for our training throughout the course—and for the ultimate decision of whether a candidate had what it takes to command a submarine and would pass or fail.

After a brief review of the course's mission and structure—14 weeks, comprising a five-week safety phase and a nine-week tactical phase, culminating in the four-week COQCFIGHT—we launched into the trainer. The safety phase is the stopwatch-intensive eyes-only period that most people think of when they hear "Perisher." The British, Dutch, and other submarine forces use roughly the same periscope procedures as the U.S. Navy; think safety sweeps and look intervals on steroids. The objective of this phase is to ensure that the candidate is capable of operating safely and making good

decisions with fast, maneuvering warships operating close to the submarine at periscope depth. By COQCEX—the at-sea fifth week in which we were called upon to demonstrate our skills in "CASEX A5" exercises with thousands of tons of real steel headed our way at 30-plus knots—we had to be able to handle four frigates within four thousand yards. But we started slow, with two-ship runs, building up over the course of four weeks in the attack trainer.

Well, it was slow for someone, anyway! My learning curve was steep. From learning the right litany to operating the periscope and doing stadimeter math to visually identifying European warships, I was starting from near the ground floor. I had plenty of experience driving the ship and operating the periscope on American submarines, and this proved to be a solid grounding; it wasn't rocket science. But my classmates had each done things this way for essentially their whole careers; they had been practicing A5 runs since they were junior officers, and I had a long way to go to catch up.

Perhaps the most unique form of A5 involved a "Q-drill." In each run, the warships that were approaching maneuvered according to set geometries designed to

achieve closest points of approach (CPAs) outside the go-deep range (GDR); the Duty Captain was prohibited from maneuvering. Sometimes they would drive straight courses through CPA; other times they would approach to just outside GDR, then make a hard turn and "skirt" around the submarine, never forcing us deep. Just when you felt comfortable that the charging frigate at 1,400 yards must be about to turn—it didn't.

Occasionally, a ship would charge right at the boat, driving inside CPA and forcing us to go deep. The Duty Captain took ranges on all other contacts, called "Wegduiken!" (essentially "emergency deep"—the only Dutch word we were required to learn), and started a stopwatch while the submarine rapidly proceeded to a safe depth. As soon as the frigate passed "on top" by sonar, the DCO turned to draw it out of the baffles, calculated to make sure that no other contact could have closed inside GDR based on their last range, and waited until the charging vessel was outside of GDR, then returned immediately to periscope depth. Eventually doing this at sea, and hearing the screw of a 3,000-ton frigate through the hull as it passed 30 feet overhead, was simultaneously exhilarating and a bit terrifying!



NLSMCC on the first day of the course.

During the trainer portion of the safety phase, there was an element of friendly competition. For each run, one member of the staff was recording every all-round look (safety sweep), setup (observation), range-for-me (range check), and angle-on-the-bow (ATB) check on a run sheet for later analysis. Each time the DCO called a range, this sailor compared it to the actual range and honked an obnoxious bicycle horn if it was off by more than 10%. Over the four weeks, these “bad ranges” were tallied up and each student contributed a few euros proportional to his total to treat the trainer staff to a (quite large) cake just before we went to sea; I was very happy not to have supplied the largest portion.

After four weeks in the trainer, we headed to Bergen, Norway to embark *Walrus* for the week-long Command Qualification Exercise (COQCEX) to put our eyes-only skills to the test. This was our first opportunity to meet the crew and wardroom that we’d be working with for the four-week COQCFIGHT at the end of the course and to serve as Duty Captain on a rotating 24-hour basis as we would during COQCFIGHT. It was also our first major evaluation in the course.

COQCEX took place in the unique environment of the Norwegian fjords. Because bad weather prevented our surface counterparts from operating in the open ocean, we spent our week in the calm, deep waters of the Sognefjord, the largest fjord in Norway. The rocky gray hills rising from the water on either side of the two-mile wide inlet were a less-than-ideal backdrop for picking out gray-hulled warships, and the merchant and high-speed ferry “contacts of opportunity” passing by less than a mile away on either side often turned a three-ship run into a four-, five-, six-, or seven-ship run!

We also faced two new challenges that hadn’t been present in the trainer. First, the physical requirements of operating the periscope were exhausting. The air-powered torque assist didn’t allow for the fine control necessary to quickly acquire and setup a contact, so it was turned off—meaning the DCO was heaving the heavy scope around with muscle power alone, as well as crouching, kneeling, or even laying on the deck to stop the periscope just above the waterline. After a 15-minute run of perhaps 25 periscope exposures, the DCO was often dripping with sweat and shaking with exertion.



The author during a COQCEX A5 run

Second, many runs were conducted in the dark. Sunrise comes late and sunset early in Norway in February, and we had practiced very few night runs in the trainer. Instead of ranging on predetermined heights for which we had math shortcuts memorized, the DCO had to use awkward heights between running lights and rough guesses at angles on the bow—meaning the whole process was slower and riskier. And we were absolutely convinced that one of our surface ship friends’ lights didn’t conform to international requirements for brightness!

In the end, all five of us performed adequately in the COQCEX and we satisfactorily progressed to the tactical phase. After a short professional conference with the UK and Norwegian SMCCs—who we had met on an earlier trip to the UK and who conducted their COQCEX at the same time—we celebrated at the Norwegian Periscope Ball before returning to the Netherlands.

Tactical Phase

Once back in Den Helder, we began the tactical phase, made up of five weeks in the trainer followed by the four weeks of COQCFIGHT at sea. Our trainer sessions were initially devoted to specific missions: submarine tracking, opposed penetration of a narrow strait via bottom contour navigation, “underwater looks” (underhull surveillance). We were responsible for planning, briefing, and executing these missions on a command level, and they required us to hone our risk mitigation skills, decision making, and command presence. Following these missions, we progressed to open scenarios. Much like when preparing for real-world tasking, we were given an intelligence briefing, collection priorities, and charts and expected to provide direction and guidance to our team to execute the mission.

The open scenarios also included a number of specified missions like time-sensitive

photo-reconnaissance of a specific coastal position or a sensor drop in a busy harbor or strait. These missions required intensive operational planning, including a detailed navigation plan. Unlike on U.S. submarines, the Dutch use paper charts for all navigation, and officers are intimately familiar with their preparation and use; all navigation, from chart prep to plotting, is performed by junior warfare officers. During *Perisher*, each student was responsible for preparing his own mission charts, from depth contours to wrecks to nav aids to the track. I hadn't touched a paper chart in eight years and had never prepared one from scratch; as a result, I was terribly slow and spent a lot of time that I should've spent thinking and planning (and, later, sleeping!) drawing charts.

During the tactical phase, we continued with professional development seminars that we had begun during the safety phase. About once a week, we spent an afternoon with various experts in a wide range of topics: an instructor in crew resource management, a psychologist specializing in stress management, a Rotterdam harbor pilot, a military lawyer, and others. These experts provided valuable insight and tools that would be useful in the course—stress management, in particular—and later, when in command of our own submarines. We spent a day in discussions with a Dutch MARSOFF (maritime special operations forces, equivalent to our SEALs) team and mine war-

fare specialists from the NATO Naval Mine Warfare Center of Excellence.

The course also included a number of professional development visits to international naval sites. Early in the safety phase, we visited the Naval Air Station Culdrose in southwest England, home of the Royal Navy's Merlin ASW helicopter squadrons; HMS Devonport, in Plymouth, where most British SSNs are homeported; and NATO Allied Maritime Command and NATO Submarine Command in Northwood, outside London. A trip to Germany included visits to the German Submarine Squadron in Eckenforde and Thyssen Krupp Marine Systems (TKMS)/Howaldtswerke-Deutsche Werft (HDW), the prolific submarine builder based in Kiel.

COQCFIGHT

In mid-March, we returned to Plymouth to embark *Walrus* once again for COQCFIGHT. This underway period was designed to simulate two covert patrols and their associated workup periods, calling on each prospective commanding officer to demonstrate the ability to conduct the full range of submarine operations and, just as importantly, to assess and prepare his crew. We began with a few days of operations off the South Coast of England, simulating pre-deployment training while providing services to NATO frigates and aircraft in structured and free-play ASW exercises and executing training photorecon missions.

On completion of our short training period, *Walrus* was tasked to conduct a covert transit from the exercise area through the Irish Sea to a patrol area in the Firth of Clyde. Here I got a real taste of the diesel submariner's challenge: when every amp out of the battery is another vulnerable minute spent snorting, all those amps must be driving you toward mission accomplishment. After battling to maintain a high-single-digit speed of advance, I can quite frankly say that I never knew how much I'd miss the ability to go 25+ knots at will until it was taken from me.

The next week and a half tested us over a variety of missions. Once in the Clyde, we embarked a NLMARSOFF team and conducted two days of reconnaissance, insertion, and extraction operations in the vicinity of the Isle of Arran. The special operators were outstanding professionals and were a pleasure to work with, though I would happily have done without all the surfacing and diving within a few hundred yards of the enemy coast. We then headed from the shallow waters around Arran to a deep-water submarine exercise area, where we spent several days honing our ASW skills against a Norwegian *Ula*-class SSK.

If anyone on board needed a lesson in the importance of good noise hygiene, he was all straightened out after our series of faceoffs with HNoMS *Utsira*. What would have been an acoustically even matchup turned into a bloodbath after *Walrus* wrapped a fishing float around her shaft and propeller on the transit to the exercise area. *Walrus's* creative crew didn't give up without a fight, though; a junior sonarman's eventual recommendation to lie in wait for our adversary dead in the water, our shaft stopped, went a long way toward evening the odds.

Fresh off a humbling reminder of the vicissitudes of chance, we headed back into the North Channel and Clyde area for a grueling three-day "mini-war." While *Walrus* operated close inshore, a pack of frigates and helicopters made life difficult for us, and I had a chance to push right to the edge of my comfort zone and take a submarine places that I never thought I would. I learned that a channel that seems quite wide when conducting a surfaced boat transfer can feel very different just a few hours later when navigating it below periscope depth, at 10 knots, by bottom contours alone.

But things didn't get any easier from



Awaiting boat transfer following COQCEX.

there. Following the mini-war, *Walrus* headed up to the Minches, between the west coast of Scotland and the Hebrides. For two weeks, we variously supported and opposed over 35 ships from nine countries—not to mention the aircraft—in the major NATO exercise JOINT WARRIOR 141. From simple submarine familiarization exercises to photo reconnaissance of surface ship gunnery and intercepts of heavily defended amphibious task forces, we did a little bit of everything. I was excited to see the P-8 Poseidon up close and personal, and a particular highlight for me was the chance to be on the receiving end of ASW as executed by a broad variety of practitioners—but whether they're American or British, Danish or Turkish, all simulated torpedoes sting just about the same.

The aggressive ASW forces we faced put us through our paces in advance of the climactic event of COQCEX: Mini-War 2. *Walrus* moved back toward the North Channel, evading detection through a quick bottom contour transit of the Orsay Gap and a sprint toward the Northern Irish coast. A calculated risk—a quick, vital snort with an enemy frigate just five miles away—had put us between a rock and a hard place: stay at PD, risk counterdetection while slowly opening from the frigate, and try to resume the snort, or sprint for the coast and relative safety, using up what precious little battery capacity we had left and blowing any chance at achieving the minelay on time?

Decision

After a quick check of the battery capacity, I ordered the Watch Leader to remain at periscope depth and walked him through the plan. We would move slowly away from the frigate, hoping her maneuver was simply part of a regular patrol pattern, and resume the snort after she turned and opened range. After a tense few minutes, she once again reversed course, and before long we were back to our much-needed battery charge.

But our luck wasn't to last. Forty minutes into our snort, *Van Speijk* suddenly turned again and charged, launching a simulated torpedo attack right down our bearing. I would later learn that she had sighted the infrared scar of our diesel exhaust with her electro-optic camera from miles away. After a few minutes of vigorous prosecution, the frigate broke contact and opened range, allowing us to regain our covert posture and



Celebrating the finish.

reposition for the early morning mining mission. It wasn't the last time we'd tangle with *Van Speijk*, but it was the last time I'd make it that easy on her. Lesson: you can't get the job done without battery capacity, but your battery capacity is irrelevant if you're dead.

In the end, though, that scenario captured much of what *Perisher* is about: when you're between a rock and a hard place, the captain decides—and doing nothing is a decision. Whether he's rested or tired, on local ops or on deployment, brand new or about to be relieved, the captain has got to have what it takes to keep his ship and crew safe, to remain undetected, and to accomplish the mission, and not always in that order. Sometimes that "having what it takes" will be getting on the periscope and driving the ship; at other times it will be understanding his crew well enough to know when they're at their limit; most often it will be the unglamorous yet anything-but-simple job of giving good direction and guidance.

By the time *Walrus* surfaced on the final day and I drank a whisky toast on the conn with *Teacher* and my remaining classmate, I had been pushed to my limits more than a few times. I'd been called upon to consider where my limits really lay, and why, and was able to reflect that my answer on the last day of the course was surely different than it had been on the first. My self-assessment and operational risk management skills had been tested more than at any other time in my career. I emerged with the confidence borne

of leading *Walrus's* crew safely and successfully through some of the most challenging submarine operations possible.

The opportunity to attend NLSMCC also provided two special benefits for an American submariner. First, I got a chance to experience firsthand the unique considerations of operating a diesel submarine. No book or intelligence briefing could ever teach me as much as I learned from simply doing it. Second, and most important, the exposure to other ways of doing business—from tactics, techniques, and procedures to personnel systems to command philosophy—was invaluable. Each one of my classmates, not to mention *Teacher* and the other Dutch officers and sailors, broadened my horizons and perspective. It's easy to fall into thinking that the way we operate submarines is the only way (or the best way) to do it, and it's incredibly useful to be reminded that that's not always necessarily true.

All told, participating in the Netherlands Submarine Command Course was among the most challenging and rewarding experiences I've had in my naval career. It taught me a great deal about command, about submarining, and about myself. If your career path offers you the opportunity to attend, I strongly encourage you to accept the challenge!

Lieutenant Commander Mewett is the Prospective Executive Officer of USS *Columbus* (SSN 762). He most recently served in the OPNAV Undersea Warfare (N97) staff and is a former Military Editor of *UNDERSEA WARFARE* magazine.



QUESTION and ANSWER with Capt. David Goggins

Captain David Goggins, Program Manager of the *Virginia*-class Submarine program at (PMS 450), sat down to discuss recent successes and the future of the *Virginia*-class program.

What is PMS 450's role in the *Virginia*-class program?

PMS 450 oversees the acquisition, design, construction, and delivery of *Virginia*-class submarines, the most technologically advanced and operationally effective submarines in the world. As the Program Manager, I oversee these functions. We have an incredible team in place in 450, and I am proud of the work we do. I truly have the best job in the Navy.

USS *North Dakota* (SSN 784) will be the first of the Block III submarines to enter service when it is commissioned later this

summer. What is different with the Block III vs. Block II?

That's a great question, but to fully answer it I need to provide some background. In 2005, then-CNO Adm. Michael Mullen issued a challenge to us: if we could reduce our per-ship acquisition cost by approximately 20 percent by Fiscal Year 2012, we would be able to increase our submarine production to two per year. This was the "2 for \$4B in 12" initiative that you've probably heard of: build two submarines for \$4 billion (in FY05 dollars) in FY12. To do so, we initiated an innovative and robust program to reduce the acquisition costs of our boats

through three focus areas. The first focus area was construction performance; we had to reduce the time it took us to build each submarine. The second area was increasing the procurement rate and using a multi-year procurement (MYP) contract. By increasing the procurement rate and using an MYP contract with economic order quantity, we were able to remove approximately \$200 million from the acquisition cost of each submarine. The final focus area, and getting back to your question, was the Design for Affordability (DFA) program. The DFA initiative introduced over 100 design changes to the Block III submarines. The two most important are the Virginia Payload Tubes (VPTs) and the Large Aperture Bow (LAB) array that are part of the redesigned bow. The water-backed LAB array uses life-of-ship hydrophones and removes nearly 1,000 SUBSAFE hull penetrations, lowering acquisition and lifecycle costs while maintaining

capability. By making the change to the LAB array, we were able to incorporate the VPTs. Like the earlier Vertical Launch System (VLS) tubes, we can still carry and launch 12 Tomahawks. However, we nearly doubled the payload capacity from 1,200 to 2,100 cubic feet, allowing for the incorporation of additional payloads.

It was recently announced that the Navy signed a contract to buy 10 *Virginia*-class Block IV submarines from FY14 to FY18. Why is the Navy buying 10 at once and not individually as with other ship building programs?

All *Virginia*-class submarines from USS *New Mexico* (SSN 779) on have been procured as multi-year procurement ships using advanced procurement (AP) and economic order quantity (EOQ). EOQ allows us to buy 10 ship sets worth of certain materials and equipment, allowing us to benefit from buying in bulk. When we talk about the savings afforded by an MYP contract with AP and EOQ, we are talking significant savings when compared to buying those same submarines one at a time through annual procurements. For the Block IV contract, we saved \$5.4 billion as compared to annual procurements. That's a savings of 16.5 percent. Not only is there a cost savings to the Navy and the tax payer, but there is also the added benefit of industry stability. By signing an MYP contract, our shipbuilding partners are able to better plan for and execute contracts with their vendors and sub-tier vendors, thereby removing industry uncertainty from the equation. It should be noted for an MYP contract that, while pricing is established and all are procured, the ships are still annually funded by Congress.

What improvements can we expect in the Block IV?

On Block III, we focused on design changes that facilitated reduced acquisition costs and an increased procurement rate. On Block IV, we are focusing on reducing operating and support (O&S) costs. By making smaller-scale design changes to increase the component-level lifecycle of the submarine, we will be able to increase the periodicity between depot maintenance availabilities and increase the number of deployments each submarine can make. Block I through III *Virginias* will undergo four depot main-

tenance availabilities and conduct 14 deployments but, through our Reduction in Total Ownership Cost (RTOC) efforts, we will be able to reduce availabilities by one to three and increase deployments by one to 15. We refer to this as 3:15. These efforts will yield an O&S savings of about \$120 million per boat.

How many *Virginias* have been delivered, under construction and under contract?

As of today, 10 *Virginias* have been delivered, nine are under construction, and an additional nine are under contract. That's 28 *Virginias* that are either out there conducting missions or in the pipeline. We are rapidly heading toward a point in time when *Virginias* will make up the bulk of the Submarine Force and, with the capabilities they bring to the fight, that is a great thing.

How much does a *Virginia*-class boat cost, and what is the average build time?

The end cost of USS *Minnesota* (SSN 783), our most recently delivered boat, was \$2.56 billion. The average build time for the boats we have delivered to date is about 74 months, but that number is skewed by the early growing pains we had that all new classes of ships face. Seven of the 10 delivered boats have actually delivered early to their contract requirements, which includes all six of the Block II submarines. USS *Mississippi* (SSN 782) was our fastest delivery to date at 62 months.

As we continue to build these submarines, we continue to refine and improve on our construction practices. For the Block IV submarines, we built that improved learning into the contract. The first three boats of the block are contracted for 62 months, and the remaining seven are contracted for 60 months. By delivering these boats at an accelerated pace, we are putting these tremendous assets into the hands of the warfighters at a time when the Combatant Commanders' demand for them outpaces their availability.

What is the Virginia Payload Module and why is the Navy designing it? How is it different than the Virginia Payload Tube?

The Virginia Payload Module, or VPM, is currently in early concept development. The VPM is a four-tube module that will add

four additional payload tubes, each capable of carrying seven Tomahawk cruise missiles, into the *Virginia*-class design. But before I get too far into the discussion of the what and the how, I want to talk about the why.

Our SSGNs are the ultimate conventional undersea strike platform. Each of these four boats is capable of carrying up to 154 Tomahawks. These boats proved their worth during Operation ODYSSEY DAWN in 2011 when USS *Florida* (SSGN 728) put over 90 missiles downrange and on target in Libya. The SSGNs, commissioned in the early 1980s, will reach the end of their service lives in the late 2020s. When the SSGNs are decommissioned, the Navy will lose approximately 60 percent of its undersea strike payload. Building 20 *Virginias* with VPMs enables the Navy to close that strike gap.

While we are still working out the initial design specifications, we do know that each VPM will have four tubes, each capable of carrying seven Tomahawks. These tubes will be very similar to the VPTs we discussed earlier that are part of our Block III and forward ships. By using these tubes in the VPM, we are leveraging mission-proven components for the new module, thereby minimizing design and cost risk. Cost is, of course, one of my main focus areas. The VPM Capabilities Development Document that the Joint Requirements Oversight Council approved in December 2013 established requirements for the program that we must achieve. The two most important are the strike capacity—going from the ability to launch 12 Tomahawks to 40—and the cost thresholds that have been established. In today's fiscally constrained budget environment, cost is on par with capability. If we can't achieve our cost targets, we cannot integrate this capability into the fleet and we will have failed the warfighter.

Will the VPM be incorporated into any of the Block IV *Virginias*?

No, the Block IV *Virginias* are already under contract, and their baseline design was established in 2012. We are targeting the beginning of Block V (FY19) for the VPM. This will reduce the trough—the low point for undersea launchers when the SSGNs retire—and get these *Virginias* with their increased capabilities to the fleet and into the hands of the operators as soon as possible.

Submarine Junior Officers



of the Year Return to D.C.

Welcome Back!

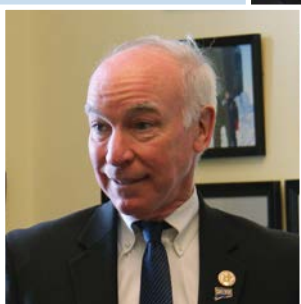
After a greatly missed one-year absence due to sequestration, the submarine Junior Officer of the Year annual trip to the nation's capital resumed. In mid-April, 12 Submariners and their families made their way to Washington, D.C. to be recognized as the 2013 Junior Officers of the Year (JOOY), an honor reserved for only the best junior officers each submarine squadron and sub tender has to offer. The JOOY program recognizes junior officers of the Submarine Force who demonstrate superior seamanship, management, leadership, and tactical and technical knowledge. Submarine candidates are nominated by their ships' junior officers and commanding officers and selected by the squadron commanders. Submarine tender candidates are selected by the ship's commanding officer.

Some of the JOOYs said selection for the award came as a bit of a shock, citing the strong competition from other junior officers in the wardroom. "I know the caliber of officer on my boat alone, never mind the squadron overall," said the Submarine Squadron 7 JOOY, Lt. Jeffrey E. Vandenengel, "so it came as a shock that I was selected when there are so many excellent junior officers to choose from." Lt. Jonathan Blair, Submarine Development Squadron 12's JOOY, said he was honored to be nominated from USS *Dallas* (SSN 700). "The award really just demonstrates the quality of the sailors, chiefs, and officers with whom I had the privilege to serve," he said. "They taught me everything I know about submarining; they kept me out of trouble and made me look good."

"The award really just demonstrates the quality of the sailors, chiefs, and officers with whom I had the privilege to serve. They taught me everything I know about submarining; they kept me out of trouble and made me look good."

Lt. Jonathan Blair, Submarine Development Squadron 12

2013 Submarine Junior Officers of the Year pose with their families in front of the U.S. Capitol building.



Congressman Joe Courtney



2013 Submarine Junior Officers of the Year meet with Rep. Joe Courtney (CT)

The annual trip provides an opportunity for the junior officers to sit down with senior leadership to discuss the current challenges and the future of the Submarine Force. They also get a well-deserved break from their hectic schedules on their boats to tour the Pentagon and other historic landmarks in D.C. with their families. Their trip started on Monday, April 7th with a daytime agenda that included a visit to Capitol Hill for meetings with congressmen and tours of the U.S. Capitol and the Library of Congress. They also enjoyed tours of the U.S. Naval Observatory, the Navy Memorial, and the National Military Command Center inside the Pentagon. Their visit culminated with the D.C.-area Submarine Birthday Ball Friday evening. They also spent time in the Pentagon and at Naval Reactors, meeting with Rear Adm. Joe Tofalo, Director, Undersea Warfare Division; Vice Adm. James Caldwell, Naval Inspector General; Vice Adm. William French, Commander, Naval Installation Command; Vice Adm. Richardson, Commander, Submarine Forces; Adm. John Richardson, Director, Naval Nuclear Propulsion Program; and Adm. Jonathan Greenert, Chief of Naval Operations.

“I could not believe the effort that goes into preparing for the development of a new platform”

Lt. Taylor Johnson,
Submarine Squadron 16

“It was great to bounce ideas off each other, hear about their experiences on other platforms and from other homeports, You realize how similar all the boats really are.”

Lt. Vandenengel, Submarine Squadron 7



2013 Submarine Junior Officers of the Year meet with Adm. Jonathan Greenert, Chief of Naval Operations

For some, the trip was a unique behind-the-curtain look at how major programs are developed start to finish. “I could not believe the effort that goes into preparing for the development of a new platform,” said Submarine Squadron 16’s Lt. Taylor Johnson when referring to the Ohio Replacement program. The best part for others was the opportunity to interact with Submariners with a wide variety of experiences. “It was great to bounce ideas off each other, hear about their experiences on other platforms and from other homeports,” said Lt. Vandenengel. “You realize how similar all the boats really are.”

A common theme shared between the JOOYs was the demand on their time on a daily basis. Being able to manage their time between divisional responsibilities, collateral duties, and qualifications is key to being a successful first-tour junior officer. Submarine Squadron 6's JOOY, Lt. Robert Schultz, recalls his early days on USS *Scranton* (SSN 756): "You have an immense workload and responsibility that you are given right away" he said. "Many times I was tasked with things that I was sure were beyond my capabilities and, each time I was able to rise up to meet these high expectations, my confidence in myself and my abilities grew."

The time dedicated to the submarine often comes at the expense of your personal life. "One week after my wedding, I left for my first six-month deployment," recalled Lt. Blair. "That was a pretty tough gut-check."

"You have an immense workload and responsibility that you are given right away. Many times I was tasked with things that I was sure were beyond my capabilities and, each time I was able to rise up to meet these high expectations, my confidence in myself and my abilities grew."

Lt. Robert Schultz, USS *Scranton* (SSN 756)

The JOOYs said the rewards of a submarine career far outweigh the challenges. The sense of accomplishment you get from overcoming adversity is truly life changing. Lt. Johnson recalled his first time taking the boat to periscope depth as a newly qualified Officer of the Deck: "It was a challenging, terrifying, and extremely exciting event. It was an unforgettable moment of my tour." Lt. Vandenengel shared a similar experience while on USS *Cheyenne* (SSN 773): "I had the amazing opportunity to serve as Officer of the Deck during the Photo Exercise for the RIMPAC Exercise in 2012. It was an entire day of maneuvering the sub 500 yards away from other ships in our formation made up of over 35 ships from over a dozen different nations. It was a once-in-a-lifetime opportunity that I will never forget."

The JOOYs emphasized job satisfaction as a big reward of being a Submariner, including getting to know a small crew, traveling to different ports, and accomplishing missions. Lt. David Guthman, Submarine Group 2's JOOY, said he found being forward deployed and serving a purpose as the most rewarding experience from his junior officer tour.

The 2014 JOOY competition will begin at the individual squadron level this fall with final nomination packages due to COMSUBFOR N10 by December 15th.

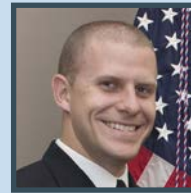
* Not pictured on right : Lt. j.g. Andrew Hutchison—USS *North Carolina* and Lt. Stephen Boatwright—USS *Frank Cable*



Lt. David Guthman
USS Newport News



Lt. Jonathan Blair
USS Dallas



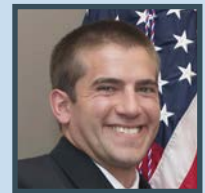
Lt. Jeffrey Vandenengel
USS Cheyenne



Lt. Merritt Pearson
USS Oklahoma City



Lt. Vanessa Esch
USS Ohio (B)



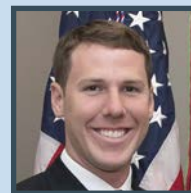
Lt. Matthew Macnac
USS Alaska (G)



Lt. James Mahan
USS Albuquerque



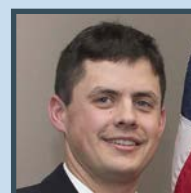
Lt. Alexandar Knowles
USS Jimmy Carter



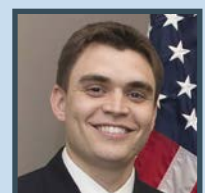
Lt. Taylor Johnson
USS Georgia



Lt. Garold Munson
USS Nevada



Lt. Joseph Sheffield
USS Springfield



Lt. Geoff Schultz
USS Scranton

Change of Command

COMSUBRON 7
Capt. Craig Blakely relieved
Capt. Rick Stoner

COMSUBRON 20
Capt. Bill Houston relieved
Capt. Chris Harkins

USS *City of Corpus Christi* (SSN 705)
Cmdr. Travis Petzoldt relieved
Cmdr. Chris Buziak

USS *Louisiana* (SSN 724) (B)
Cmdr. Michael J. Daigle relieved
Cmdr. Kevin Bryne

USS *Pennsylvania* (SSBN 735) (B)
Cmdr. John Cage relieved
Cmdr. Gustavo Gutierrez

USS *Tennessee* (SSBN 734) (G)
Cmdr. Chris Bohner relieved
Cmdr. Richard Dubansky

USS *Toledo* (SSN 769)
Cmdr. Michael Majewski relieved
Cmdr. Sam Geiger

USS *Tucson* (SSN 770)
Cmdr. Mike Beckett relieved
Cmdr. James O'Harrah

USS *Wyoming* (SSBN 742) (B)
Cmdr. Wayne Wall relieved
Cmdr. Barry Rodriguez

ARCO (ARDM 5)
Lt. Cmdr. Kevin Sims relieved
Lt. Cmdr. Michael Thompson

Qualified For Command

Lt. Darius Ahamdi
COMSUBRON 11

Lt. Cmdr. Corey Barksdale
USS *Albany* (SSN 753)

Lt. Matthew Becker
COMSUBDEVRON 5

Lt. Christian Beisel
USS *Providence* (SSN 719)

Lt. Robert Cizek
USS *Alexandria* (SSN 757)

Lt. Christopher Clevenger
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. Cmdr. David Daigle
USS *Alaska* (SSBN 732) (B)

Lt. Cmdr. James Fuls
COMSUBRON 11

Lt. Derek Goebel
USS *Boise* (SSN 764)

Lt. Robert Gore
USS *Pennsylvania* (SSBN 735) (B)

Lt. Cmdr. Jonathan Guidy
COMSUBRON 19

Lt. Christopher Holland
USS *Alaska* (SSBN 732) (B)

Lt. William Howey
USS *Alaska* (SSBN 732) (G)

Lt. Kenneth Ingle
USS *Santa Fe* (SSN 763)

Lt. Phillip Jones
USS *Minnesota* (SSN 783)

Lt. Michael Kendel
USS *Albany* (SSN 753)

Lt. Cmdr. Mark Levin
USS *Key West* (SSN 722)

Lt. Cmdr. William Mangan
USS *Helena* (SSN 725)

Lt. Adam Matthews
COMSUBRON 7

Lt. Cmdr. Joshua McCright
USS *Maine* (SSBN 741) (G)

Lt. Cmdr. Zachary Merritt
USS *Alexandria* (SSN 757)

Lt. Samuel Mills
USS *Rhode Island* (SSBN 740) (G)

Lt. Cmdr. Kevin Moeller
USS *Wyoming* (SSBN 742) (G)

Lt. Brandon Monaghan
USS *Asheville* (SSN 758)

Lt. David Nichols
COMSUBDEVRON 12

Lt. Christian Olsen
USS *Dallas* (SSN 700)

Lt. Cmdr. Andrew Pittman
USS *Scranton* (SSN 756)

Lt. Matthew Powell
USS *Norfolk* (SSN 714)

Lt. Jonathan Scobo
USS *Boise* (SSN 764)

Submarine officers graduate from NPS Masters Degree program for nuclear-trained officers

Six submarine officers recently became the first graduates of the Naval Postgraduate School (NPS) Master of Engineering Science (Mechanical Engineering) (MSES-ME) distance learning program.

The MSES-ME program was created by the NPS Mechanical and Aerospace Engineering (MAE) Department specifically for Navy nuclear-trained officers and leverages the graduate-level equivalency credit obtained through successful completion of Naval Nuclear Power School (NNPS). The degree is modeled after a program for officers assigned to Naval Reactors (NR) headquarters in Washington, D.C. who graduate from Bettis Reactor Engineering School (BRES).

"After the success of the BRES program, Naval Reactors asked us to develop a similar program for graduates of NNPS serving in the fleet. We responded with the MSES-ME curriculum", said Professor Knox Millsaps, chairman of the NPS MAE Department.

An officer graduate of NNPS is granted 28.5 graduate-level credits that automatically become part of their NPS transcripts. Upon admission to the MSES-ME program, students must complete six additional courses in thermal and fluid sciences plus a research paper to meet degree requirements. The six courses are now all available asynchronously allowing maximum flexibility to officers on sea or shore duty. Students can also take the same courses offered to NR headquarters staff via synchronous video teleconference or streaming video. Two such courses are offered every quarter.

"We currently have over 50 students worldwide actively enrolled in the program," said Capt. (ret.) Dan Prince, program administrator. "We ship the textbooks and DVD lectures and the student interfaces directly with the course professor as student schedules permit. The professors of these courses are experts in their field, heavily involved in research and resident teaching, but who go out of their way to support the unique needs and demanding schedules of nuclear-trained officers." Students are already reacting favorably to this new educational offering.

"The program afforded me a unique opportunity to apply my Navy nuclear training toward an engineering graduate degree," said Lt. Robert Szeligowski, Engineer Officer on USS *Hartford* (SSN 768) and March 2014 graduate of the MSES-ME program. "And the fact that I was able to participate in the program while also serving in a challenging assignment at the Pentagon was important to me."

The six graduates and their current duty station:

LT Nicholas Roa, USS *Ohio* (SSGN 726) (B)

LCDR John Kinman, USS *Michigan* (SSGN 727) (B)

LT Jeremy Janney, Naval Submarine School

LT Robert Szeligowski, USS *Hartford* (SSN 768)

LT Towney Kennard, Naval Submarine School

LT John Carter, Nuclear Power Training Unit, Ballston Spa

For more information, contact MSSEMEDL@nps.edu or visit <http://www.nps.edu/Academics/GSEAS/MAE/DL/nuc.asp>

Lt. Philip Sosebee
USS *Wyoming* (SSBN 742) (B)

Lt. Joslyn Veney
COMSUBRON 11

Lt. George Watkins
USS *Helena* (SSN 725)

Qualified In Submarines

Lt. j.g. Daniel Bennett
USS *Cheyenne* (SSN 773)

Lt. j.g. Joshua Calton
USS *San Juan* (SSN 751)

Lt. j.g. Kyle Gayle
USS *Newport News* (SSN 750)

Lt. j.g. John Grider
USS *Louisville* (SSN 724)

Lt. j.g. Jarret Griesmer
USS *Connecticut* (SSN 22)

Lt. Ian Hardey
USS *Asheville* (SSN 758)

Ens. Joshua Hedges
USS *Alabama* (SSBN 731) (B)

Lt. j.g. Robert Hummel
USS *Jefferson City* (SSN 759)

Lt. j.g. Phillip Igoe
USS *North Carolina* (SSN 777)

Lt. j.g. Carl Kaufman
USS *Seawolf* (SSN 21)

Lt. j.g. Jacob Laird
USS *Nevada* (SSBN 733) (B)

Lt. j.g. Jonathan MacDurmon
USS *Corpus Christi* (SSN 705)

Lt. j.g. Aaron Marchant
USS *Seawolf* (SSN 21)

Lt. j.g. Benjamin Mooney
USS *San Juan* (SSN 751)

Lt. j.g. Aaron O'hern
USS *Asheville* (SSN 758)

Lt. j.g. Robert Piazza
USS *Louisville* (SSN 724)

Lt. j.g. Andrew Roth
USS *Alabama* (SSBN 731) (B)

Lt. j.g. Joshua Rothman
USS *Mississippi* (SSN 782)

Lt. j.g. Josheua Samuelson
USS *Seawolf* (SSN 21)

Lt. j.g. Alex Scaperotto
USS *North Carolina* (SSN 777)

Lt. j.g. Holden Smith
USS *North Carolina* (SSN 777)

Lt. j.g. Mark Spiva
USS *Newport News* (SSN 750)

Lt. Garrett Sterling
USS *Connecticut* (SSN 22)

Lt. j.g. Austin Thompson
USS *Alabama* (SSBN 731) (B)

Lt. j.g. Tyler Williams
USS *Newport News* (SSN 750)

Lt. j.g. Caleb Young
USS *Asheville* (SSN 758)

Qualified Nuclear Engineering Officer

Lt. Justin Bardin
USS *Nevada* (SSBN 733) (G)

Lt. j.g. Thomas Beuerman
USS *Santa Fe* (SSN 763)

Lt. j.g. Robert Block
USS *California* (SSN 781)

Lt. Nicholas Bona
USS *Houston* (SSN 713)

Lt. j.g. Jeremy Bricco
USS *Minnesota* (SSN 783)

Lt. j.g. Scott Carper
USS *Dallas* (SSN 700)

Lt. j.g. Jennifer Carroll
USS *Maine* (SSBN 741) (B)

Lt. j.g. Patrick Cooper
USS *Tennessee* (SSBN 734) (G)

Lt. j.g. Bradley Craig
USS *Rhode Island* (SSBN 740) (G)

Lt. j.g. Amber Cowan
USS *Maine* (SSBN 741) (B)

Lt. Kristopher Curtis
USS *Olympia* (SSN 717)

Lt. j.g. Kyle Davis
USS *Kentucky* (SSBN 737) (B)

Lt. j.g. Dean Dobransky
USS *Olympia* (SSN 717)

Lt. j.g. Samuel Donovan
USS *Jimmy Carter* (SSN 23)

Lt. j.g. Andrew Faulkner
USS *Cheyenne* (SSN 773)

Lt. Muhammad Furqan
USS *Georgia* (SSGN 729)

Lt. j.g. Bryan Glock
USS *Hawaii* (SSN 776)

Lt. Stephen Grossi
USS *Dallas* (SSN 700)

Lt. j.g. Dennis Guy
USS *Hawaii* (SSN 776)

Lt. j.g. Aaron Hanks
USS *Alabama* (SSBN 731) (G)

USS Nebraska wins Omaha Ballistic Missile Trophy



Commanders hold the 2013 Omaha Submarine Ballistic Missile Trophy following its presentation to the crew of USS *Nebraska* (SSBN 739) at Bangor, Wash. April 11, 2014. The Omaha Trophy is sponsored by Omaha's Strategic Command Consultation Committee and awarded annually to four outstanding units that represent U.S. Strategic Command's (USSTRATCOM) mission areas, their role in global operations, and continued emphasis on strategic deterrence.

Pictured holding the trophy, from left to right, are Cmdr. Jason Wartell, former CO of USS *Nebraska's* Blue Crew, Capt. Jeffrey Joseph, USS *Nebraska's* combined Green Crew CO, and USSTRATCOM's commander Adm. Cecil D. Haney.

Lt. j.g. Erik Hanson
USS *Louisiana* (SSBN 743) (G)

Lt. j.g. David Harden
USS *Ohio* (SSGN 726) (B)

Lt. j.g. Daniel Harman
USS *San Francisco* (SSN 711)

Lt. Hugh Harron
USS *West Virginia* (SSBN 736) (B)

Lt. j.g. Sean Heenan
USS *Albuquerque* (SSN 706)

Lt. j.g. Jean Hernandez
USS *West Virginia* (SSBN 736) (G)

Lt. j.g. Alexander Hydrean
USS *San Francisco* (SSN 711)

Lt. j.g. Phillip Igoe
USS *North Carolina* (SSN 777)

Lt. j.g. Fielding Isaacs
USS *Kentucky* (SSBN 737) (B)

Lt. j.g. Aaron Kalfus
USS *Santa Fe* (SSN 763)

Lt. j.g. Carl Kaufman
USS *Seawolf* (SSN 21)

Lt. j.g. Justin Kramer
USS *Pasadena* (SSN 752)

Lt. j.g. Erienne Kriesch
USS *Ohio* (SSGN 726) (G)

Lt. j.g. Van Lawson
USS *Key West* (SSN 722)

Lt. j.g. Grant Lee
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. j.g. Marquette Leveque
USS *Wyoming* (SSBN 742) (G)

Lt. j.g. Brian Linville
USS *Springfield* (SSN 761)

Lt. j.g. Paul Mallory
USS *Pasadena* (SSN 752)

Lt. j.g. Christopher Marino
USS *Henry M. Jackson* (SSBN 730) (G)

Lt. j.g. Emma McCarthy
USS *Georgia* (SSGN 729) (B)

Lt. j.g. Matthew McCoy
USS *Louisiana* (SSBN 743) (G)

Lt. j.g. Jeffery McCormick
USS *Georgia* (SSGN 729)

Lt. j.g. Ryan McNichols
USS *Pasadena* (SSN 752)

Lt. j.g. Casey Murphy
USS *Tennessee* (SSBN 734) (G)

Lt. j.g. Alex Nielsen
USS *Cheyenne* (SSN 773)

Lt. j.g. Jason Ogle
USS *Asheville* (SSN 758)

Lt. Luke Penner
USS *Louisiana* (SSBN 743) (G)

Lt. j.g. Thomas Prinsen
USS *Rhode Island* (SSBN 740) (G)

Lt. j.g. Eric Quirk
USS *Tennessee* (SSBN 734) (G)

Lt. j.g. Frank Roney
USS *Bremerton* (SSN 698)

Lt. j.g. Rachael Sakurai
USS *Ohio* (SSGN 726) (B)

Lt. Pedro Serrano
USS *Scranton* (SSN 756)

Lt. j.g. Ryan Shinnick
USS *Scranton* (SSN 756)

Lt. j.g. Joshua Shishkoff
USS *Hawaii* (SSN 776)

Lt. j.g. Stephen Spaulding
USS *Florida* (SSGN 728) (G)

Lt. j.g. Hayden Starkey
USS *Nebraska* (SSBN 739) (G)

Lt. j.g. David Steinberger
USS *Columbia* (SSN 771)

Lt. j.g. Brian Stewart
USS *Houston* (SSN 713)

Lt. j.g. Austin Vanolst
USS *Minnesota* (SSN 783)

Lt. j.g. Coleman Ward
USS *Houston* (SSN 713)

Lt. j.g. Joshua Williams
USS *Texas* (SSN 775)

Lt. j.g. Eric Wittig
USS *Pennsylvania* (SSBN 735) (B)

Lt. Michael Yelle
USS *Seawolf* (SSN 21)

Supply Corps Officer, Qualified In Submarines

Lt. Shannon Bencs
USS *Florida* (SSGN 728) (B)

Ens. John McMahon
USS *San Juan* (SSN 751)

Medical Officer Qualified in Submarines

Lt. Kent Hall
Navy Expeditionary Combat
Command

Lt. Nicholas DiGeorge
Federal Health Care Center, Lovell

Lt. Blair Lee
Naval Submarine School

Lt. Joseph Yetto
Navy Experimental Diving Unit

Lt. Nicholas Durocher
Naval Submarine Support Center,
New London

Engineering Department Master Chief

ETC Nathaniel W. Abel
USS *Maine* (SSBN) (B)

EMC Antonio T. Aguinaldo, Jr.
USS *Bremerton* (SSN 698)

MMC Paul E. Bermingham
USS *Houston* (SSN 713)

EMC Matthew J. Blankenship
USS *Pittsburgh* (SSN 720)

MMC Nicholas W. Bottoms
USS *Jacksonville* (SSN 699)

MMC Andrew P. Chupashko
USS *Alexandria* (SSN 757)

MMC Christopher B. Hisey
USS *Alabama* (SSBN 731) (B)

EMC Michael V. Garland
USS *Annapolis* (SSN 760)

MMC Brandon J. Good
USS *Dallas* (SSN 700)

ETC Garth A. Gordon
Shipyard Rep – Groton

MMC Roy W. Johnson
Naval Nuclear Power Training
Command (NNPTC)

MMC Jonathan S. Lambert
USS *Annapolis* (SSN 760)

MMC Elton G. Lee
USS *Springfield* (SSN 761)

ETC Christopher J. Little
USS *Louisville* (SSN 724)

MMC Michael J. MacDonnell
USS *Minnesota* (SSN 783)

EMC Mitch E. Mahan
USS *La Jolla* (SSN 701)

MMC Stephen M. McKinley
USS *Georgia* (SSGN 729) (G)

ETC Ryan B. McVeigh
USS *Virginia* (SSN 774)

EMC Peter A. Olson
Naval Submarine Support Facility
New London

MMC Anthony J. Romano
USS *California* (SSN 781)

MMC Wesley M. Shuman
USS *Louisville* (SSN 724)

ETC Matthew C. Smith
USS *Norfolk* (SSN 714)

MMC Gary D. Vandyk
USS *West Virginia* (SSBN 736) (B)

USS *Columbus* arrives in Japan



The *Los Angeles*-class fast attack submarine USS *Columbus* (SSN 762) arrived at Fleet Activities Yokosuka April 19 for a visit as part of its deployment to the Western Pacific.

While in Yokosuka, *Columbus* Sailors will participate in numerous events, including a submarine birthday ball that will be hosted by Commander, Submarine Group 7 in Tokyo.

Columbus is scheduled to participate in various exercises in the region during the remainder of her deployment.



Don't Miss the Boat!

Submit Your Photos to Naval Submarine League's 15th Annual Photo Contest

UNDERSEA WARFARE Magazine is looking for this year's top submarine related photos for the 15th Annual Photo Contest, sponsored by the Naval Submarine League. The best of the best will be published in the Fall 2014 edition.

Note: Entries must be received by August 15, 2014. However time permitting, photos received shortly after the deadline will be considered.

Photos must be at least 5" by 7", at least 300 dots-per-inch (dpi) and previously unpublished in printed media. Each person is limited to five submissions, which can be sent as JPG or other digital photo format to the email address below. Printed photos may also be mailed to the following address:

Military Editor
Undersea Warfare CNO
2000 Navy Pentagon
Washington, D.C. 20350-2000

Or email to: jeffrey.s.gammon1@navy.mil



Cash Prizes for the Top 4 Photos:

1st Place \$500

2nd Place \$250

3rd Place \$200

Honorable Mention \$50



Submarine Museums and Memorials



USS *Becuna* (SS 319) Philadelphia, Pa.

Aptly named for a variety of large Barracuda, USS *Becuna* (SS-319), a *Balao*-class submarine, was launched in January, 1944. The USS *Becuna* served in WW II, Korea and Vietnam, receiving four battle stars for her WW II service. During this period she completed five war patrols in the Philippines, South China Sea and Java Sea. *Becuna* is credited with having sunk two Japanese tankers, (*Nichiryu Maru*, assisted USS *Hawkbill* (SS 366) with the sinking of the oiler *Tokuwa Maru* and damaged another oiler totaling 3888 tons.

Built in New London, Conn. *Becuna* was launched by Electric Boat Co. and headed to her homeport of Pearl Harbor in July 1944. Her war operations extended from August 23, 1944 to July 27, 1945. On her first war patrol, her lookouts spied a convoy of three merchant ships escorted by a destroyer. *Becuna* submerged and fired a spread of six torpedoes. While she evaded a depth-charge attack, her crew heard an explosion but could not verify any sinking. She had a similar experience on October 8 when she launched torpedoes at a heavily escorted tanker north of Palawan Passage in the Philippines. Again her crew heard two distinct explosions, but were too busy evading depth charges to observe the results of the attack. The following day, however, the submarine recorded her first verifiable success when she joined USS *Hawkbill* (SS 366) in sinking the 1,943 ton freighter *Tokuwa Maru*.

On her third war patrol, she returned to the coast of French Indochina where she encountered a Japanese convoy off Cape Padaran. She fired a spread of torpedoes at the merchant tanker *Nichiryu Maru* and sent the vessel to the bottom. The Japanese

escorts bombarded the submarine with 70 depth charges while she evaded into the deep.

The submarine arrived at Subic Bay Luzon from her last war patrol 27 July 1945. In September 1945 she arrived at San Diego Calif. Following the war, *Becuna* continued to operate with Submarine Force Pacific Fleet until April 1949 when she was ordered to Submarine Force Atlantic Fleet as a unit of Submarine Squadron 8.

Between May 1949 and May 1950 she conducted refresher training exercises and also assisted in training of student officers and men at New London Conn. In November 1950 she returned to Electric Boat Co. for a complete modernization overhaul being refitted as a Guppy-type submarine with additional batteries, a snorkel, sophisticated radar and torpedo equipment including nuclear warheads. With the overhaul completed in August 1951, *Becuna* sailed to the Caribbean for shakedown. She returned to New London in September 1951.

During the Korean and Vietnam Wars *Becuna* conducted operations with the Atlantic Fleet making two cruises with the 6th Fleet in the Mediterranean and one to Scotland trailing Soviet submarines with eavesdropping equipment aboard. Other than these extended cruises the majority of *Becuna's* remaining service was conducted in New London as a training submarine.

Becuna was decommissioned in 1969 and has been part of Independence Seaport Museum's Historic Ship Zone since 1996. *Becuna* is a National Historic Landmark and is on the National Register of Historic Places.